

Features

- Ideally Suited for Automatic Insertion
- Complementary PNP Types: BC856W – BC858W
- For Switching and AF Amplifier Applications
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP capable (Note 4)**

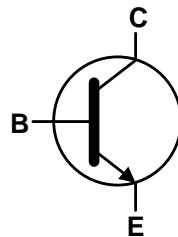
Mechanical Data

- Case: SOT323
- Case Material: Molded Plastic, "Green" Molding Compound
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per
MIL-STD-202, Method 208 Ⓔ3
- Weight: 0.006 grams (Approximate)

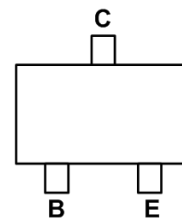
SOT323



Top View



Device Symbol


 Top View
Pin-Out

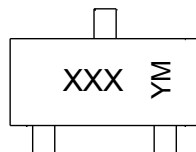
Ordering Information (Notes 4 & 5)

Product	Compliance	Marking	Reel Size (inches)	Quantity per Reel
BC846AW-7-F	AEC-Q101	K1Q	7	3,000
BC846BW-7-F	AEC-Q101	K1R	7	3,000
BC846BWQ-7-F	Automotive	K1R	7	3,000
BC846BW-13-F	AEC-Q101	K1R	13	10,000
BC847AW-7-F	AEC-Q101	K1Q	7	3,000
BC847BW-7-F	AEC-Q101	K1R	7	3,000
BC847BW-13-F	AEC-Q101	K1R	13	10,000

Product	Compliance	Marking	Reel Size (inches)	Quantity per Reel
BC847BWQ-13-F	Automotive	K1R	13	10,000
BC847CW-7-F	AEC-Q101	K1M	7	3,000
BC847CW-13-F	AEC-Q101	K1M	13	10,000
BC847CWQ-7-F	Automotive	K1M	7	3,000
BC848AW-7-F	AEC-Q101	K1Q	7	3,000
BC848BW-7-F	AEC-Q101	K1R	7	3,000
BC848CW-7-F	AEC-Q101	K1M	7	3,000

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_compliance_definitions/.
 5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



XXX = Product Type Marking Code
(Please see Ordering Information)
YM = Date Code Marking
Y or \bar{Y} = Year (ex: E = 2017)
M or \bar{M} = Month (ex: 9 = September)

Date Code Key

Year	2016	2017	2018	2019	2020	2021	2022	2023
Code	D	E	F	G	H	I	J	K

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Collector-Base Voltage	BC846	V _{CBO}	80	V
	BC847		50	
	BC848		30	
Collector-Emitter Voltage	BC846	V _{CEO}	65	V
	BC847		45	
	BC848		30	
Emitter-Base Voltage	BC846, BC847	V _{EBO}	6	V
	BC848		5	
Continuous Collector Current		I _C	100	mA
Peak Collector Current		I _{CM}	200	mA
Peak Base Current		I _{BM}	200	mA

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 6)	P _D	200	mW
Thermal Resistance, Junction to Ambient	(Note 6)	R _{θJA}	625	°C/W
Operating and Storage Temperature Range		T _J , T _{STG}	-65 to +150	°C

ESD Ratings (Note 7)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
6. For a device mounted on minimum recommended pad layout 1oz weight copper that is on a single-sided FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
 7. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BC846	BV _{CBO}	80	—	—	V	I _C = 100μA
	BC847		50				
	BC848		30				
Collector-Emitter Breakdown Voltage (Note 8)	BC846	BV _{CEO}	65	—	—	V	I _C = 10mA
	BC847		45				
	BC848		30				
Emitter-Base Breakdown Voltage	BC846, BC847	BV _{EBO}	6	—	—	V	I _E = 100μA
	BC848		5				
DC Current Gain (Note 8)	Current Gain Group	A	110	180	220	—	V _{CE} = 5.0V, I _C = 2.0mA
		B	200	290	450		
		C	420	520	800		
Collector Cutoff Current		I _{CBO}	—	—	20	nA	V _{CB} = 30V
					5	μA	V _{CB} = 30V, T _A = +150°C
Collector-Emitter Saturation Voltage (Note 8)		V _{CE(sat)}	—	90	250	mV	I _C = 10mA, I _B = 0.5mA
				200	600		I _C = 100mA, I _B = 5.0mA
Base-Emitter Turn-On Voltage (Note 8)		V _{BE(on)}	580	660	700	mV	I _C = 2mA, V _{CE} = 5V
			—	—	770		I _C = 10mA, V _{CE} = 5V
Base-Emitter Saturation Voltage (Note 8)		V _{BE(sat)}	—	700	—	mV	I _C = 10mA, I _B = 0.5mA
				900			I _C = 100mA, I _B = 5mA
Output Capacitance		C _{obo}	—	3	4.5	pF	V _{CB} = 10V, f = 1.0MHz
Transition Frequency		f _T	100	300	—	MHz	V _{CE} = 5V, I _C = 10mA, f = 100MHz
Noise Figure		NF	—	—	10	dB	V _{CE} = 5V, I _C = 200μA R _S = 2kΩ, f = 1kHz Δf = 200Hz

Note: 8. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

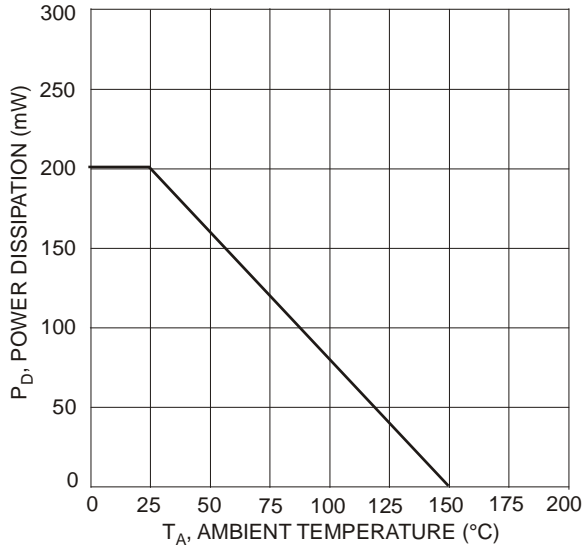


Figure 1 Power Dissipation vs. Ambient Temperature

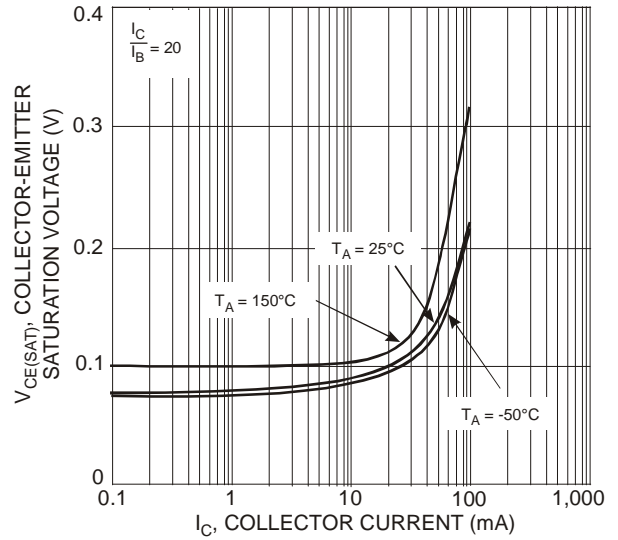


Figure 2 Typical Collector-Emitter Saturation Voltage vs. Collector Current

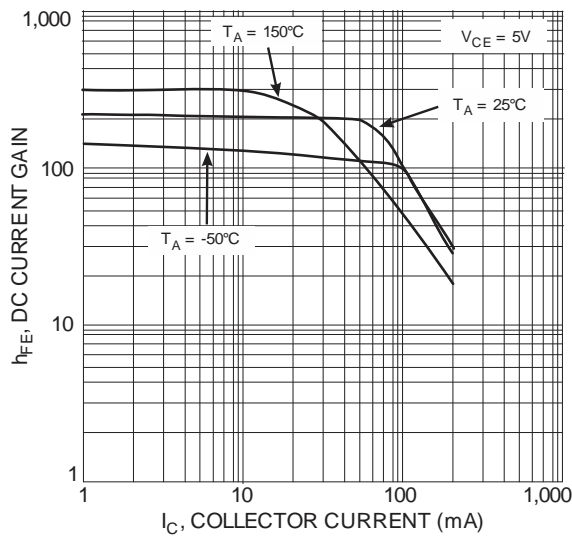


Figure 3 Typical DC Current Gain vs. Collector Current (Band A Group Gain)

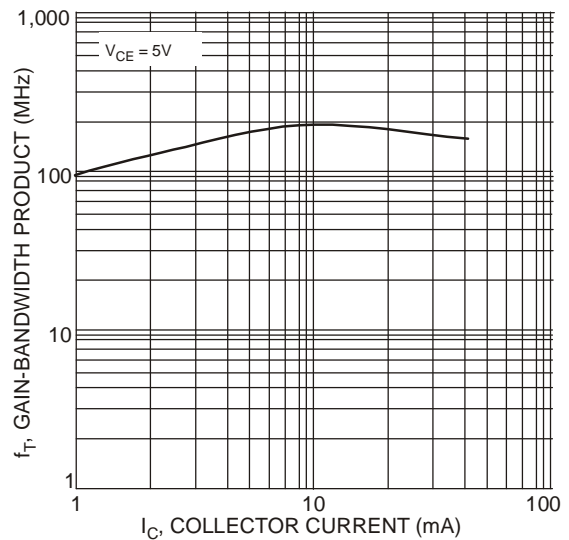


Figure 4 Typical Gain-Bandwidth Product vs. Collector Current

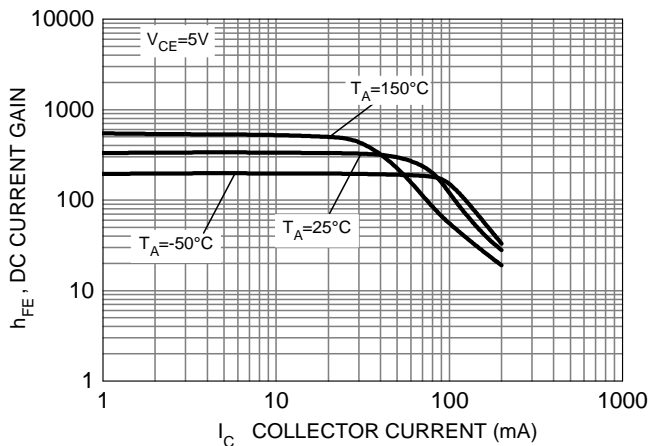


Figure 5 Typical DC Current Gain vs. Collector Current (Band B Group Gain)

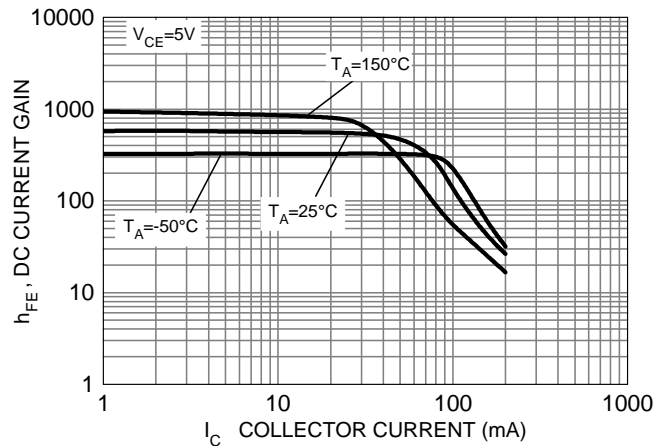
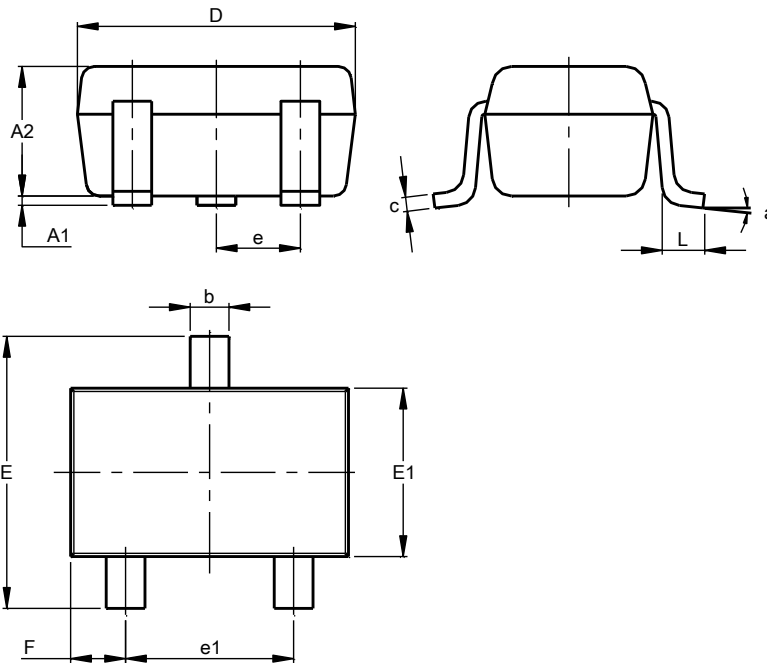


Figure 6 Typical DC Current Gain vs. Collector Current (Band C Group Gain)

Package Outline Dimensions

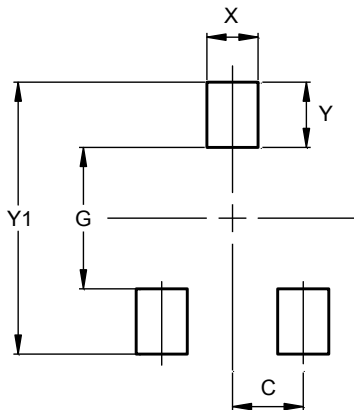
Please see <http://www.diodes.com/package-outlines.html> for the latest version.



SOT323			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.90	1.00	0.95
b	0.25	0.40	0.30
c	0.10	0.18	0.11
D	1.80	2.20	2.15
E	2.00	2.20	2.10
E1	1.15	1.35	1.30
e	0.650 BSC		
e1	1.20	1.40	1.30
F	0.375	0.475	0.425
L	0.25	0.40	0.30
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.



Dimensions	Value (in mm)
C	0.650
G	1.300
X	0.470
Y	0.600
Y1	2.500

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